



# Tap Buildings, Mine Infrastructure for Cheapest, Cleanest Energy

Nicholas Occhipinti  
West Michigan Environmental Action  
Council





WMEAC has been a non-profit environmental education and advocacy organization since 1968 based in Grand Rapids. We're focused on Building [Sustainable Communities](#) and [Protecting Water Resources](#).



WMEAC thanks the Governor for listening

We hope the Governor's energy forums  
will pave the way for a long-term  
energy plan for Michigan that includes  
more renewables, increased energy  
efficiency



# Agenda

Focused mostly on energy efficiency

- Control Costs/Minimize Risk
- Highlight West Michigan Initiatives
  - Holland
  - Better Buildings for Michigan
- State-level policy tools

# US Chamber of Commerce

*“The best source of new energy is the energy we can save every day... We must expand the suite of voluntary programs, mandates, and fiscal incentives for greater benefits of energy efficiency.”*

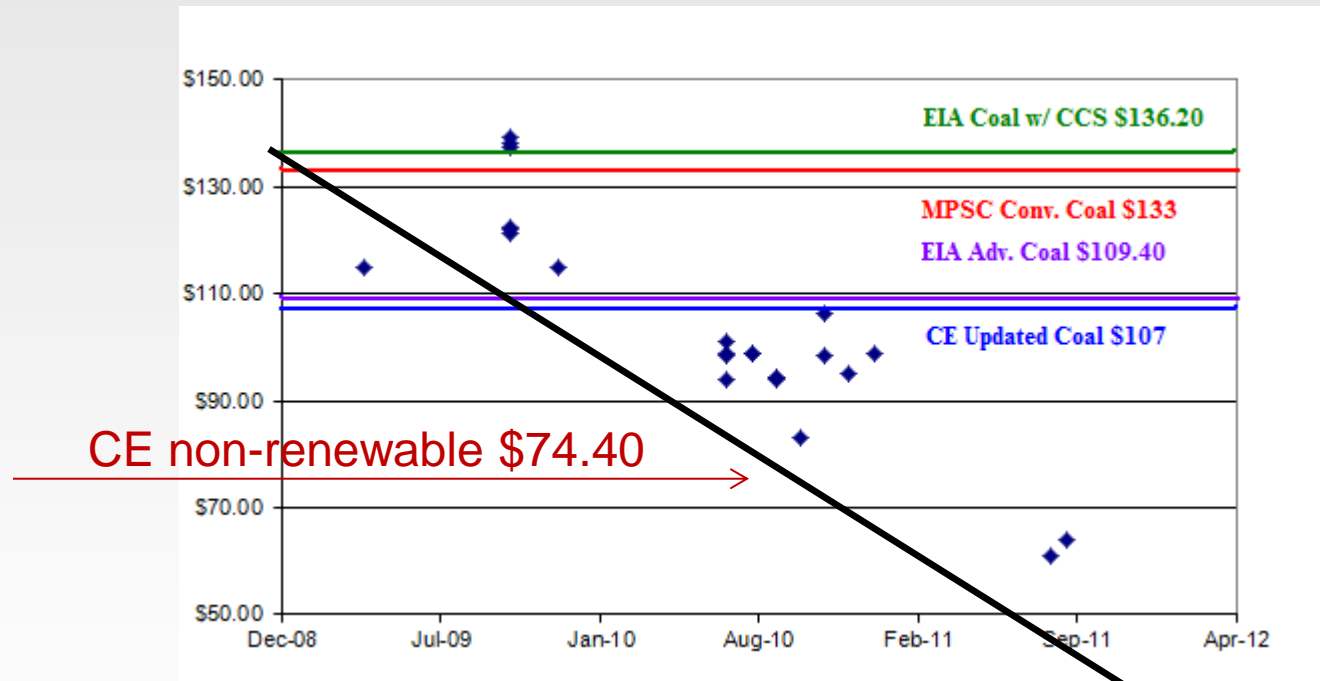
-Letter to the President and Congress

# Energy Efficiency is the Cheapest, Cleanest, and most quickly deployed source of energy

**Table 3: Cost Effectiveness of Energy Optimization and Renewable Energy Standards**

<b>Cost-Effectiveness of Energy Optimization and Renewable Energy Standards</b>	
<b>Energy Optimization Cost of Conserved Energy Weighted Average (\$/MWh)</b>	<b>\$20.00</b>
<b>Renewable Energy Weighted Average Cost (\$/MWh)</b>	<b>\$82.54</b>
<b>Combined Weighted Average Cost of Energy Optimization and Renewable Energy (\$/MWh)</b>	<b>\$45.98</b>
<p><b>Source:</b> Energy Optimization cost data from 2012 REPORT ON THE IMPLEMENTATION OF P.A. 295 UTILITY ENERGY OPTIMIZATION PROGRAMS.</p> <p>Renewable energy cost data is based on levelized costs provided as part of the renewable energy contract approval process.</p>	

# Renewable Energy is Cost Competitive



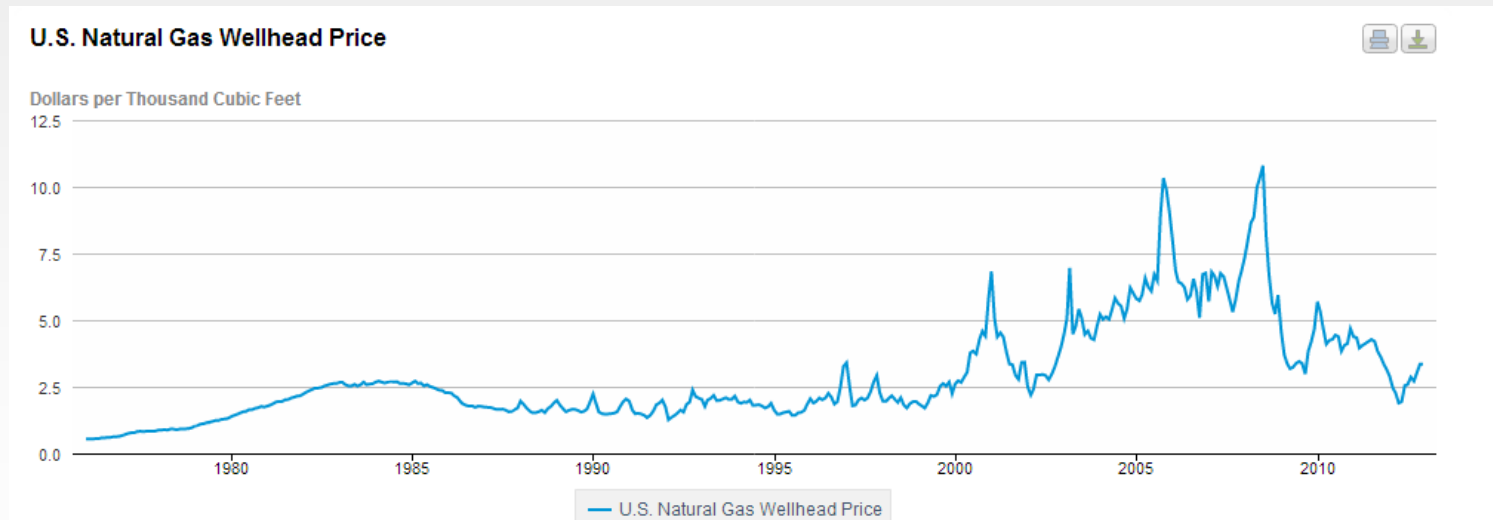
Renewable Energy : \$82.54 per Mwh

City of Holland wind \$45.72

# Minimize Risk: Price Volatility

March of 2012 natural gas hit bottom at \$2.25 per 1000 cubic feet

Just a few years ago, July of 2008 natural gas was \$10.79 cents per 1000 cubic feet....





# Expect Price Volatility



The screenshot shows the top navigation bar of the Oil & Gas Journal website. The logo is in yellow on a dark background. To its right are links for 'UNCONVENTIONAL OIL & GAS', 'MAGAZINE', and 'PAST ISSUES'. Below this is a secondary navigation bar with buttons for 'HOME', 'GENERAL INTEREST', 'EXPLORATION & DEVELOPMENT', and 'DRILLING & PRODUCTION'. The main content area features a breadcrumb trail: 'Home » More General Interest » MARKET WATCH: Declining storage boosts natural gas prices'. The article title is 'MARKET WATCH: Declining storage boosts natural gas prices' in large, bold, black text. Below the title is the location and date 'HOUSTON, Mar. 15 03/15/2013', followed by the author 'By Sam Fletcher' and his title 'OGJ Senior Writer'. The article text begins with 'A faster-than-expected decline in US natural gas storage triggered a 3.6% price jump for the front-month contract Mar. 14 in the New York futures market while crude increased 0.6% from a marginal decline in the previous session.' The second paragraph states 'The Energy Information Administration reported the withdrawal of 145 bcf of natural gas from US underground storage during the week ended Mar. 8, exceeding Wall Street's consensus for a 137 bcf pull. That left 1.938 tcf of working gas in storage, down 440 bcf from the year-ago level but 198 bcf above the 5-year average (OGJ Online, Mar. 14, 2013).'

**OIL & GAS JOURNAL**

UNCONVENTIONAL OIL & GAS   MAGAZINE   PAST ISSUES

HOME   GENERAL INTEREST   EXPLORATION & DEVELOPMENT   DRILLING & PRODUCTION

Home » More General Interest » **MARKET WATCH: Declining storage boosts natural gas prices**

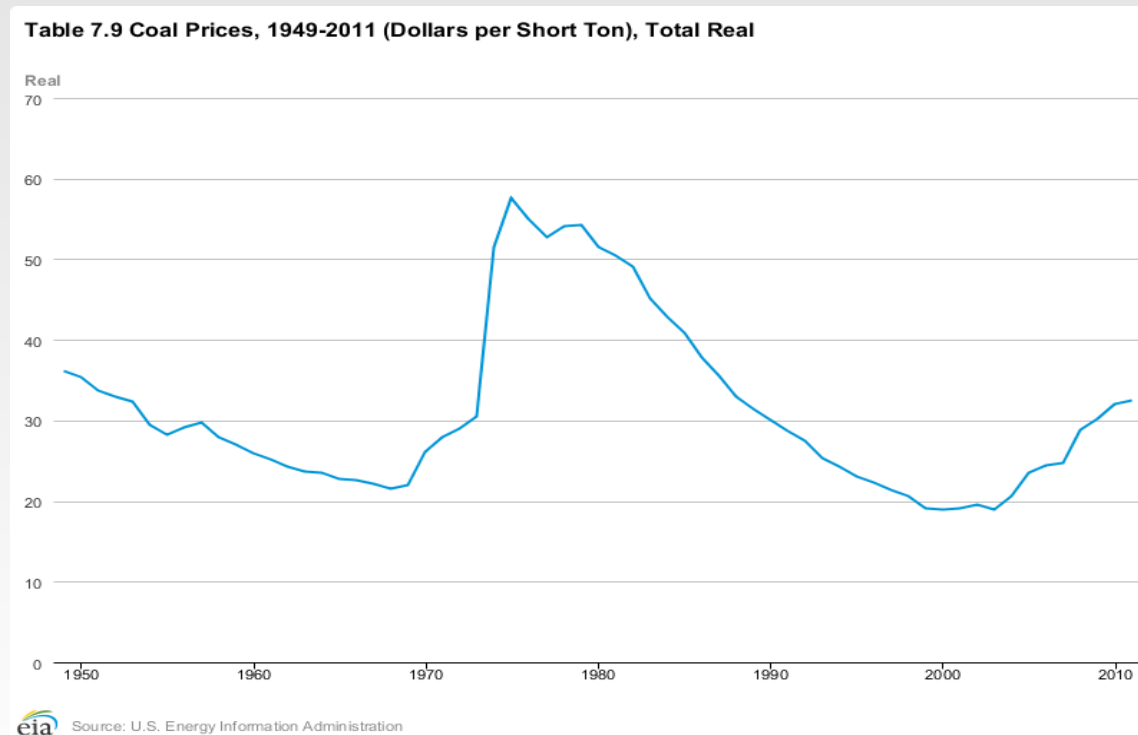
## **MARKET WATCH: Declining storage boosts natural gas prices**

HOUSTON, Mar. 15  
03/15/2013  
By Sam Fletcher  
OGJ Senior Writer

A faster-than-expected decline in US natural gas storage triggered a 3.6% price jump for the front-month contract Mar. 14 in the New York futures market while crude increased 0.6% from a marginal decline in the previous session.

The Energy Information Administration reported the withdrawal of 145 bcf of natural gas from US underground storage during the week ended Mar. 8, exceeding Wall Street's consensus for a 137 bcf pull. That left 1.938 tcf of working gas in storage, down 440 bcf from the year-ago level but 198 bcf above the 5-year average (OGJ Online, Mar. 14, 2013).

# Real Price of Coal

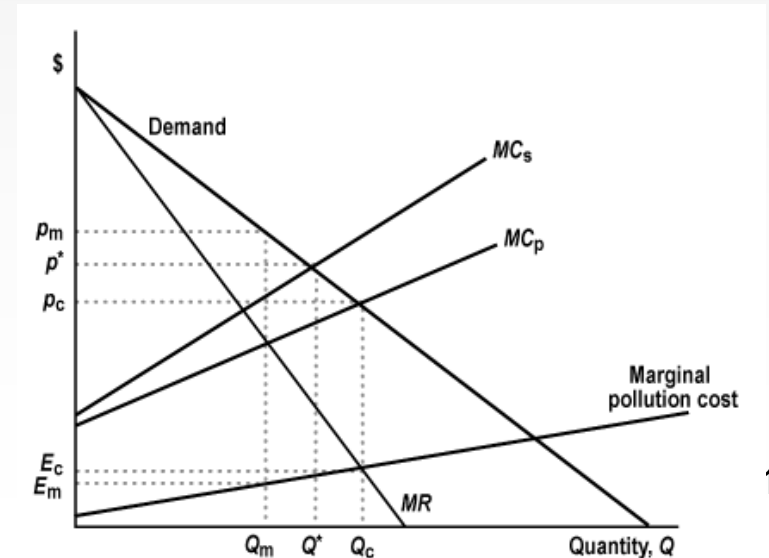


The point: Diversify portfolio with low marginal cost clean energy

# Control Costs

To find the real cost of energy we must monetize externalities.

Until we do we will produce and consume energy inefficiently.



# Monetize True Costs

The current system ignores documented costs of over \$1 billion annually



# External Costs

## Valuation of Annual Public Health Impacts

Electricity Generating Unit	Michigan	Continental U.S.
B.C. Cobb	\$68,000,000	\$450,000,000
Karn/Weadock	\$120,000,000	\$720,000,000
Harbor Beach	\$11,000,000	\$63,000,000
JH Campbell	\$150,000,000	\$700,000,000
JR Whiting	\$560,000,000	\$1,040,000,000
River Rouge	\$340,000,000	\$780,000,000
St. Clair	\$65,000,000	\$560,000,000
Trenton Channel	\$140,000,000	\$1,080,000,000
Total	\$1,500,000,000	\$5,400,000,000

Prepared for: Michigan Environmental Council

Prepared by: Environmental Health & Engineering, Inc. (2011)



# Externalities are a yearly billion \$ subsidy from Michiganders to ratepayers

HEALTH IMPACT	NUMBER OF CASES
Premature mortality	660
Cardiovascular hospital admissions	150
Respiratory hospital admissions	210
Chronic bronchitis	280
Asthma emergency room visits	450
Asthma exacerbations	250,000
Minor restricted activity days	260,000



# Monetize Externalities

One way:

All new energy generation investments should go through an expanded and more robust Integrated Resources Planning regime that includes a valuation of externalities, regulatory and pollution control costs, and should compete with energy optimization.

# Impossible to Monetize Externalities?

No, Holland BPW did it last year.

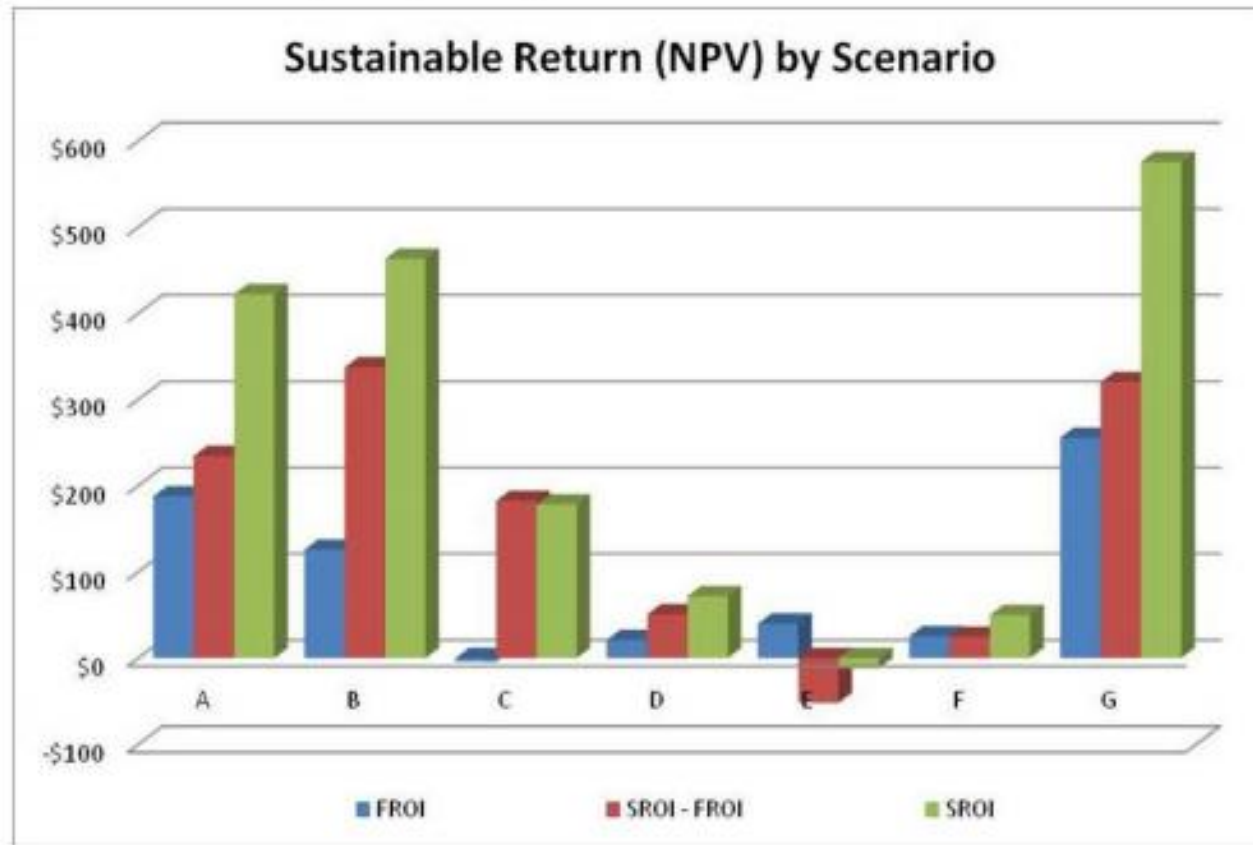
- Holland and Community Stakeholders participated in a Sustainable Return on Investment Analysis
- Cost-Benefit analysis of multiple generation options that monetized external costs and benefits





# 7 Scenarios Analyzed

Figure 18: SROI by Component, NPV \$M



Green = Sustainable Return, Blue is Financial

# Holland Energy Plan

- With more time and thought, creativity and community participation emerged
- Ex: Community Task Forces
  - Home Energy Retrofits, Labeling, Education and Outreach and more.
    - Innovative financing model emerged from the Home Energy Retrofit Task Force – On-Bill

# On-Bill Financing

- Finance energy audits and retrofits directly on utility bills – paid for from the savings of the newly installed efficiency improvements.
- Opportunity costs, transaction costs, risk and the landlord-tenant dilemma

# Notable On-Bill financing programs

Kansas's How\$mart program



City of Portland Housing Bureau

Clean Energy Works Oregon

Electric Cooperatives of South Carolina

Rural Energy Savings Program

# Better Buildings for MI (BBFM)

- DOE ARRA Grant Funded Program
  - 2000 energy efficiency audits and retrofits
  - Community, network, and neighborhood approach; open to all income levels
  - access to incentives and affordable loans.



# BBFM

- This is not about light bulbs!
  - Real and permanent home energy improvements such as insulation and air sealing
  - Wall and attic insulation plus air sealing typically yields 15%-20% energy savings



# BBFM: Lesson Learned

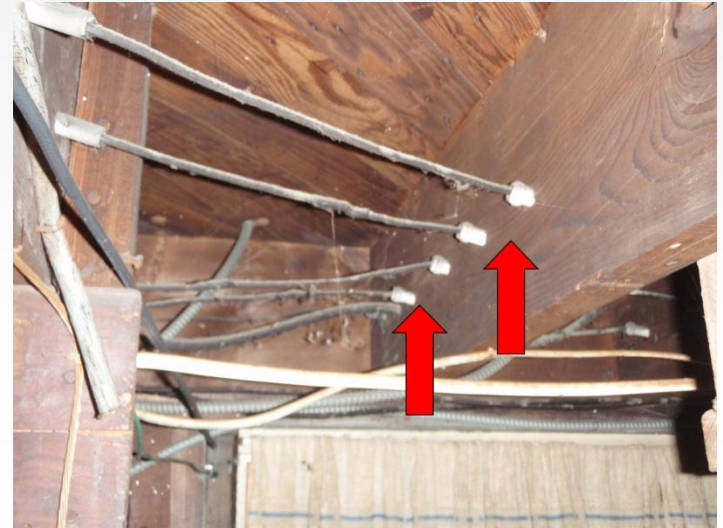
- Cold recruiting EE customers is expensive; we should leverage regulated customer/utility relationships to decrease cost.
- Policies and programs needed to spur, automate and capture ratepayer interest in energy efficiency
  - Opt-Out utilized with Smart Meters



# Leave No Building Behind

## Indoor Home Health Issues

- Nob and tube wiring, asbestos
- Need new ideas, programs, and financing to get at these homes; preferably all in one go.

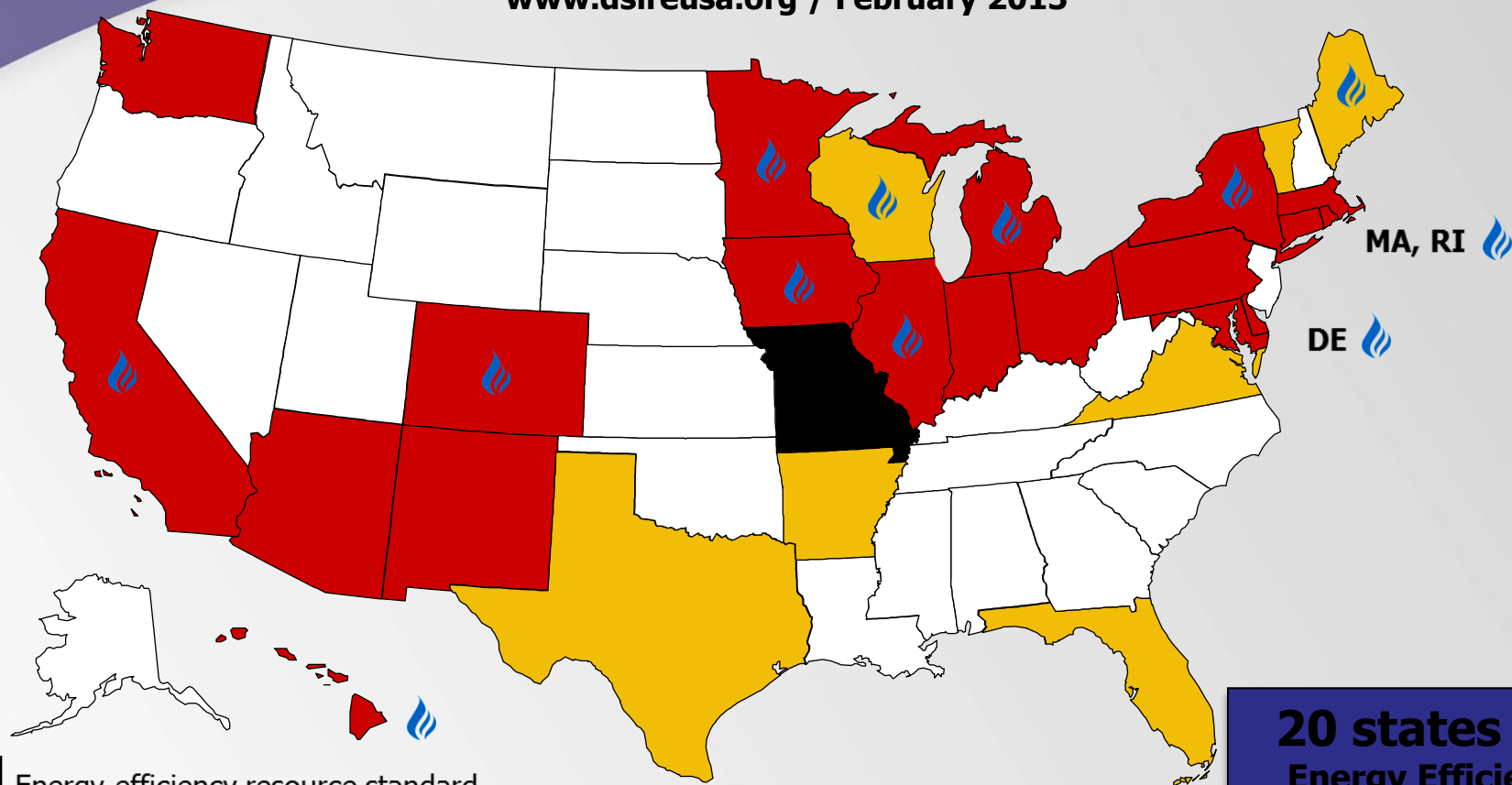




What state-level policy tools are available to encourage energy efficiency?

# Energy Efficiency Resource Standards

www.dsireusa.org / February 2013



Energy efficiency resource standard



Energy efficiency resource goal



Policy includes natural gas savings requirements or goals

**20 states have  
Energy Efficiency  
Resource Standards  
(7 states have goals)**

Note: See following slide for a brief summary of policy details. For more details on EERS policies, see [www.dsireusa.org](http://www.dsireusa.org) and [www.aceee.org/topics/eers](http://www.aceee.org/topics/eers).

# ***EERS Policy Details***

**Arizona:** 22% cumulative electricity savings by 2020; 6% cumulative gas savings by 2020.

**Arkansas:** 0.75% of 2010 electric sales reduction by 2013; 0.4% of 2010 gas sales reduction by 2013.

**California:** Varies by utility.

**Colorado:** Electricity sales and demand reduction of 5% of 2006 numbers by 2018 (statutory requirement); natural gas savings requirements vary by utility .

**Connecticut:** 4% of retail load (includes CHP and waste heat recovery).

**Delaware:** Electricity and peak demand savings equivalent to 15% of 2007 numbers by 2015; natural gas savings equivalent to 10% of 2007 natural gas consumption by 2015.

**Florida:** 7,842 GWh cumulative reductions from 2010-2019 (statewide goal); 3,024 MW cumulative summer peak demand reduction from 2010-2019, 1,937 MW, cumulative winter peak demand reduction from 2010-2019 (statewide goal).

**Hawaii:** 4,300 GWh reduction in electricity use by 2030.

**Illinois:** 2.0% reduction of 2008 electricity sales by 2015; 1.1% reduction of 2008 peak load demand by 2018; 8.6% cumulative natural gas savings by 2020.



**Indiana:** 2.0% electricity sales reduction by 2019.

**Iowa:** Varies by utility.

**Maine:** 30% reduction of electricity and natural gas sales by 2020.

**Maryland:** 15% reduction in per capita energy consumption by 2015, compared to 2007; 15% reduction in per capital peak demand by 2015, compared to 2007.

**Massachusetts:** Reduce 1,103 GWh electricity in 2012 (statewide); reduce 24.7 million therms by 2012 (statewide).

**Michigan:** 1.0% annual reduction of previous year retail electricity sales by 2012; 0.75% annual reduction of previous year retail natural gas sales by 2012.

**Minnesota:** 1.5% reduction of previous 3-year average retail electric sales by 2010; 1.5% reduction of previous 3-year average retail natural gas sales by 2010.

**Missouri :** 9.9% cumulative electricity savings by 2020; an additional 1.9% each year thereafter. 9% cumulative peak reduction by 2020; an additional 1% each year thereafter.

**New Mexico:** 10% of 2005 total retail kWh sales by 2020.

**New York:** 15% reduction relative to projected electricity use in 2015; gas savings of 112 Bcf annually by 2020.

**Ohio:** 22.0% reduction of previous 3-year average retail electricity sales by 2025.

**Pennsylvania:** 3% of projected June 2009 - May 2010 electricity consumption by May 31, 2013; 4.5% of measured June 2007 - May 2008 peak demand by May 31, 2013.

**Rhode Island:** Varies by utility.

**Texas:** 25% reduction in annual growth in demand 2012; 30% reduction in annual growth in demand 2013.

**Vermont:** 320,000 MWh electricity savings (3-year goal for 2012, 2013, 2014); summer peak kW savings: 60,800 (3-year goal for 2012, 2013, 2014).

**Virginia:** 10% electricity savings by 2022 relative to 2006 base sales.

**Washington:** Varies by utility.

**Wisconsin:** 2011-2014: Net annual electric energy savings of 1,816,320,000 kWh; net annual natural gas savings of 73,040,000 therms.

# Energy Efficiency Policy Tools

**Rules, Regulations & Policies for Energy Efficiency**

Federal =   State =   Local =  

State	Appliance/Equipment Standards	Energy Standards for Public Buildings	Building Energy Codes	Public Benefits Funds
Federal	<span style="border: 1px solid black; padding: 0 2px;">1</span>	<span style="border: 1px solid black; padding: 0 2px;">1</span>	<span style="border: 1px solid black; padding: 0 2px;">0</span>	<span style="border: 1px solid black; padding: 0 2px;">0</span>
Alabama		<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	
Alaska			<span style="background-color: red; color: black; padding: 0 2px;">1</span>	
Arizona	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">2</span> <span style="background-color: blue; color: black; padding: 0 2px;">3</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	
Arkansas		<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	
California	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span> <span style="background-color: blue; color: black; padding: 0 2px;">8</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span> <span style="background-color: blue; color: black; padding: 0 2px;">5</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>
Colorado		<span style="background-color: red; color: black; padding: 0 2px;">1</span> <span style="background-color: blue; color: black; padding: 0 2px;">2</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span> <span style="background-color: blue; color: black; padding: 0 2px;">3</span>	<span style="background-color: blue; color: black; padding: 0 2px;">1</span>
Connecticut	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>
Delaware		<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>
Florida		<span style="background-color: red; color: black; padding: 0 2px;">1</span> <span style="background-color: blue; color: black; padding: 0 2px;">3</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	
Georgia		<span style="background-color: red; color: black; padding: 0 2px;">1</span> <span style="background-color: blue; color: black; padding: 0 2px;">2</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	
Hawaii		<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>
Idaho		<span style="background-color: red; color: black; padding: 0 2px;">1</span>	<span style="background-color: red; color: black; padding: 0 2px;">1</span>	

# Financial Policy Tools

Financial Incentives for Energy Efficiency

Federal =   State =   Utility =   Local =  

State	Personal Tax	Corporate Tax	Sales Tax	Property Tax	Rebates	Grants	Loans	Bonds	Green Building
Federal	<span style="border: 1px solid black; padding: 0 2px;">2</span>	<span style="border: 1px solid black; padding: 0 2px;">3</span>	<span style="border: 1px solid black; padding: 0 2px;">0</span>	<span style="border: 1px solid black; padding: 0 2px;">0</span>	<span style="border: 1px solid black; padding: 0 2px;">0</span>	<span style="border: 1px solid black; padding: 0 2px;">3</span>	<span style="border: 1px solid black; padding: 0 2px;">4</span>	<span style="border: 1px solid black; padding: 0 2px;">0</span>	<span style="border: 1px solid black; padding: 0 2px;">0</span>
Alabama					<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">8</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">1</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">2</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">7</span>		
Alaska					<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">2</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">5</span>		
Arizona				<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">18</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">2</span>		<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">2</span>		<span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">4</span>
Arkansas					<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">12</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">2</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">3</span>		
California					<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">2</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">75</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">2</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">3</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">3</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">8</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">7</span>		<span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">4</span>
Colorado					<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">44</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">3</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">2</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">3</span>		
Connecticut			<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">10</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">4</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">3</span>		
Delaware					<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>				
Florida		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>			<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">32</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">2</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">3</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">3</span>		<span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">1</span>
Georgia		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>		<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">21</span>	<span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">7</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">1</span>		
Hawaii					<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">4</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">1</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">2</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>
Idaho	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>				<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">20</span>		<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">4</span>		
Illinois					<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">2</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">30</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">6</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">3</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">1</span>
Indiana					<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">47</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">1</span>		<span style="background-color: #add8e6; border: 1px solid black; padding: 0 2px;">2</span>
Iowa					<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">35</span>	<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">1</span>	<span style="background-color: #f08080; border: 1px solid black; padding: 0 2px;">1</span> <span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">2</span>		
Kansas					<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">1</span>		<span style="background-color: #90ee90; border: 1px solid black; padding: 0 2px;">1</span>		

Thank You

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